IM 561[1]

Managerial Economics
Fall 2003
Monterey Institute of International Studies

10 September 2003
Lecture Notes

Lecture Outline

1. Specialization and Trade

2. Production Possibilities

3. Constant versus Diminishing Returns

4. Economic Growth Using the PPF

5. The Margin Concept

6. Demand

   - Law of Demand
   - Individual Demand Curves
   - Market Demand Curves
   - Other Influences on Demand

7. Supply
   - Law of Supply
   - Changes in Supply

[1] *Students using these lecture notes should be aware that the notes are written to remind the instructor of what core concepts need to be covered in each lecture. It is highly probable that the instructor will use examples, topics, and content outside these notes and the student recognizes that the material covered in class is what will be covered in quizzes and examinations.*

1. Specialization and Trade

"Specialization is for insects" - Robert Heinlein, 1942

The foundation of a modern society is its ability to specialize. Labor is specialized to the point that, in some factories, it is the job of one person to thread a certain bolt and the job of another person to tighten the bolt.

Capital is specialized. Examples for physical and financial capital specialization.

Land and Entrepreneurship also contain examples of specialization. Examples?

Without specialization, each of us would have to be self-sufficient. Instead of attending class, you would have to forage/hunt for food, seek/build shelter, find clean water, and so on. This would not leave much time for other pursuits.

In economics, we observe (positive economics) how specialization results in gains in efficiency (productive efficiency), and decreases resource costs in production. Society has answered this basic economic question by increasing the rewards to specialized labor.

Division of Labor

The **division of labor** entails dividing the work required to produce a given product or to accomplish a given task into separate elements. As the task at hand is divided into ever smaller sub-tasks, each worker's ability to perform their task increases due to greater familiarity. Efficiency increases, resource costs decline, and production increases for a given set of resources.

The question is then, can labor become too specialized?

Note that while labor specialization results in productivity gains, specialization does not address the root economic question as to what should be produced; by whom it shall be produced; and for whom it shall be produced.

Comparative Advantage

In order to reap the full benefits of labor specialization, a society should produce those goods which it can produce at lowest cost and trade with other societies for other, more costlier goods.

The **law of comparative advantage** states that mutually beneficial exchange is possible whenever relative production costs differ prior to trade.

First, let us examine what the term 'relative production costs' means. Recall the concept of opportunity costs, that the cost of a decision take is the value of the best alternative forgone. We now can apply this concept to the exchange process.

Individuals, groups, societies, nations; all gain by producing goods at relatively low costs and exchanging these goods for different goods produced by others at relatively low cost.

We can examine the concept of relative production costs by using the same methodology we used to explore the relative prices of economic goods. For example, let us assume the following example applies to the countries of the United States and Mexico.

We assume that two goods are produced, computers and cars. Before specialization, assume that the following distribution of production and consumption applies.

United States	20 hours labor = 10 computers 20 hours labor = 1 car
Mexico	20 hours labor = 1 computer 20 hours labor = 2 cars

Thus, before specialization and trade, the United States produces (10 computers, 1 car) and Mexico produces (1 computer, 2 cars).

Now, let us assume that Mexico and the United States can trade with each other. It is in each countries interest to specialize in the production of the good that is relatively cheaper for them to produce. What will each country produce?

Let us calculate relative production costs:

United States: 1 car = 10 computers
Mexico: 1 car = ½ computer

Thus, in the United States is more efficient in producing computers than cars, and conversely, Mexico is more efficient in producing cars than computers. Thus, if the United States produces only computers, it will produce 20 computers and have 10 computers free for trade. If Mexico produces only cars, it can produce 4 cars, with 2 cars free for trade.

	Pre-Specialization	Post-Specialization and Trade
United States	10 computers 1 car	10 computers 2 cars
Mexico	1 computer 2 cars	10 computers 2 cars

The question:

Does this result still hold if the United States holds an **absolute advantage** in the production of all products?

Assume that instead of 20 hours of labor = 1 car for the United States, 20 hours of labor = 4 cars. What is the result of specialization and trade?

Query: What is a country has an absolute and comparative advantage? What should happen?

2. Production Possibilities

A Productions Possibilities Frontier (PPF) depicts the maximum combinations of goods a society can produce in a given period, given fixed total resources and a constant state of technology.

PPF model assumptions:

A. Land, labor, capital, and entrepreneurship are constant. Different combinations of these resources can be used among different types of production.

B. Technology, which includes physical, financial, and human capital, is constant.

C. All scarce resources are fully and efficiently employed along the boundary of the PPF.

D. Simply put: time, resources, and technology are fixed.

Constant Cost Production Possibilities

We can examine the PPF model. Let us return to the classic example of guns and butter, where the production of guns is displayed on the **X** axis and the production of butter is displayed on the **Y** axis.

Illustrated in class…multiple examples

The PPF is represented by the bold line. Along the PPF line, resources are fully utilized. Thus, for example, the point which lies on the PPF line, represents a full utilization of resources in the economy.

Points above the PPF line are unattainable **(B)**. There is no combination of resources, production, and technology that can produce such a combination of goods. Finally, if the

economy is producing a combination of goods below the PPF **(A)**, the economy can reallocate resources to move to the PPF.

This PPF model assumes constant returns to production. Note that as we move along the PPF, we are giving up 1 gun for 1 pound of butter. Thus, relative prices are constant, that is, one gun produced has an opportunity cost of 1 pound of butter foregone.

Now, while the constant returns to production PPF is helpful in illustrating the trade-offs between goods, it is not entirely practical in that it fails to incorporate the concept of diminishing returns.

3. Diminishing Returns

The law of diminishing returns states that as any activity is extended, it eventually becomes increasingly difficult to pursue the activity further.

What does this mean?

The law of diminishing returns is grounded in the realization that the benefits to consumption and/or production do not always increase. As you add successive units of a resource to production, or consume successive units of an economic good, past some point the benefit derived from adding an additional unit will decline.

How does this principle manifest itself in reality?

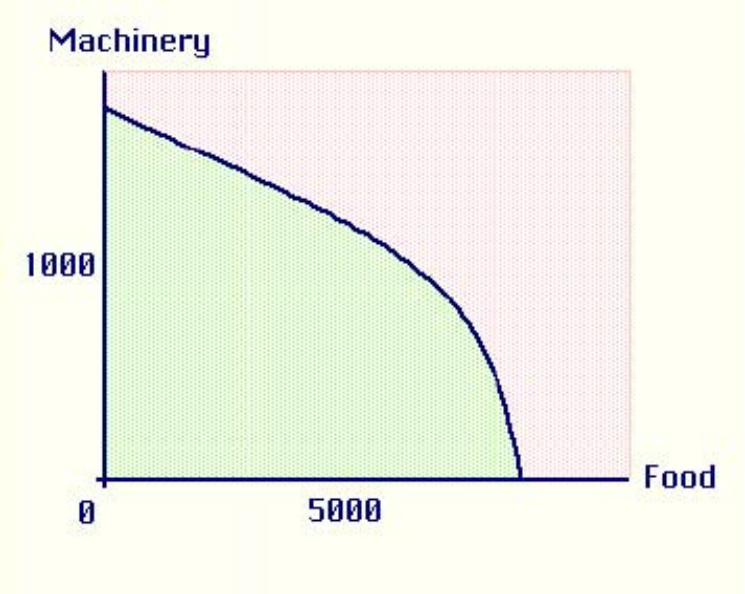
Let's say you decide to eat lunch at an 'all you can eat' restaurant and that you missed the previous two meals because you were studying for this class. From the first plate, you will undoubtedly derive a great deal of satisfaction. The second plate may give somewhat less satisfaction as the first plate.. Now, the third plate probably won't taste as good as the second plate and the fourth plate won't taste as good as the third plate and so on.

We can apply the same concept with respect to production. As one adds more labor, for example, to the production process, beyond some point there will be too much labor in the factory/office for efficient production to occur.

<u>Increasing opportunity costs</u>

The principal of increasing opportunity costs is a result of the law of diminishing marginal returns.

The principal: Repeatedly increasing output by some set proportion ultimately requires more than proportional increases in resources, and thus, higher costs.



What does this mean? As noted previously, as you increase resources to production, past some point, the additional benefits to adding that resource will decline. Thus, to have the same additional benefits as the last input, you will have to add more than the last input.

	Guns	Butter	Opportunity Cost
A	5000	0	
B	4800	400	
C	4000	800	
D	3000	1200	
E	1200	2000	
F	0	2400	

Using the above example, we can mathematically and graphically illustrate the concept of increasing opportunity costs and its impact on the PPF.

Note that what we are concerned with are the costs in the margin, not the absolute amounts. We are concerned with the additional benefit derived from a unit of change, that is, for each gun we give up at point C, how much butter is produced in return?

The increasing opportunity costs are reflected in the concave slope of the PPF. As we move along the PPF, we must relinquish ever increasing amounts of one good to produce the other good.

Additional example?

4. Economic Growth

If we hold resources and technology constant, a society can not 'grow'. As illustrated by the PPF used in the previous section, with a fixed endowment of resources and constant state of technology, we can only allocate resources to achieve the maximum possible output for each combination of goods, but we can not exceed the boundary of the PPF. Economic growth, on the other hand, occurs as the result of a technological advance, an increase in the availability or quantity of resources, or an increased value in exchange for the goods which a nation produces.

As economic growth occurs, the boundary of the PPF shifts outward. How it shifted is dependent upon what is fueling economic growth.

Technological Advance

Most of us link economic growth with technological change. This is readily apparent due to the impact that technology has had upon our lives in the past twenty years. Discuss

Increases in the availability or quantity of resources

By increasing the overall quantity of the resource base, a society can allocate more resources to production, thereby increasing the amount of goods that can be produced and consumed. This same effect is possible is the quality of resources increases, meaning that by using the same production technology, the higher quality of the input resource allows more production to occur.

Discuss: Brown Coal in E. Germany, Education Impact on Labor

International Trade

International Trade is often referred to as the engine of economic growth. Recall from the previous section on comparative advantage how specialization and trade can increase the consumption possibilities of a society.

We can use the comparative advantage example to develop PPFs for the United States and Mexico. If we assume that each country is operating efficiency along their respective PPFs, we can draw a tangential line to each of the PPFs to illustrate the consumption possibilities of the United States and Mexico due to international trade.

External Debt and Development

Consumption and investment on each axis. Illustate how flow of foreign capital/aid can expand PPF, if resources are put into investment, hope is over time, economy will grow to cover debt costs..if diverted to consumption (corruption), then economy falls below original PPF

5. The Margin Concept

Economics is concerned with decisions at the margin, that is, not absolute amounts but the incremental changes in prices, costs, and other factors.

For example, in our discussion of diminishing returns to production, we noted that after some point, returns to successive input units decline, that is, the return to each additional unit of labor (capital, land, entrepreneurship) decline.

In economics, we refer to the last unit added/subtracted (purchased/sold) as the marginal unit.

For example, if you decide to purchase five cheeseburgers, we will examine the impact of the fifth cheeseburger to your personal satisfaction and weigh the additional benefit from consuming the fifth cheese against the opportunity cost of consuming the fifth cheeseburger.

Illustration of Marginal Utility, Marginal Product

6. Demand

Demand is the quantity of a specific good that people are willing and able to buy during a specific period, given the choices available.

Note that demand is not only the expression of preferences, that is, what individuals want to purchase, but that demand is the combination of desire and ability, that is, not only must people be willing to purchase, they must have the ability (resources) to purchase.

Simply put, each of us in this room may want to purchase a Mercedes, but the demand for the product consists only of those individuals with the willingness and the money (ability) to purchase the car.

We can further differentiate between willingness and ability in that there are two sets of relative prices: market prices and demand prices.

Market prices are those prices charged for goods regardless of whether the goods are purchased by individuals. Demand prices, on the other hand, reflect the relative values an individual places on having a marginal amount more (or less) of a good.

What does this mean? For example, let us assume that the market price of a Mercedes SUV is $45,000. Regardless of whether you purchase one or not, the price to another individual will also be $45,000 (assuming no negotiation on price, etc).

However, each individual will have their own demand price for the Mercedes relative to the other goods they may (and can) purchase. If your subjective valuation of Mercedes is such that your demand prices meets or exceeds the market price, then you will purchase the Mercedes. If, on the other hand, your relative prices are such that your demand price falls below the market price, you will not purchase.

Law of Demand

Before discussing the Law of Demand, we should digress for a moment to explore the meaning of *ceteris paribus*, or *all else remaining equal*.

The concept of ceteris paribus is used in economics so that we may examine the influences of the change in one variable on another variable, that is, the impact of an independent variable (price) on a dependent variable (quantity demanded). This simplification is necessary and useful since if we allowed other variables to change at the same time, the interactive effects would complicate the analysis. That being said, *ceteris paribus* is not the 'key phrase' in economics, and students should avoid the *ceteris paribus* disease, that is, the belief that the increased used of *ceteris paribus*, all else remaining equal, will result in a higher grade.

Law of Demand: *All else remaining equal, consumers buy more of a good during a given period the lower its relative price, and vice versa*.

Simply put, the law of demand states that as the relative price of a good declines (increases), the amount of the good desired for purchase by consumers with the ability to purchase increases (decreases).

Thus, if the demand price of a Mercedes decreased by 50%, *ceteris paribus*, relative prices would change (Mercedes would be relatively cheaper), and individuals would consume more Mercedes. In response to changes in relative prices, they would substitute away from other, relatively more expensive goods to purchase a Mercedes.

Now, recall that we previously examine the law of diminishing returns to production, that is, the marginal return to successive units of a resource decline or:

The law of diminishing returns states that as any activity is extended, it eventually becomes increasingly difficult to pursue the activity further.

We can modify this statement to focus on the demand for a good.

Principle of Diminishing Marginal Utility: The more you have of any good relative to other goods, the less you desire and are willing to pay for additional units of the good.

In other words, as you consume more of a good relative to other goods, in the

margin, the benefit you derive from each marginal unit declines, hence, the relative value you place on additional units of the good also declines.

Thus, we can break down the impact of the principle of diminishing marginal utility into two effects:

Substitution effect:	As the relative price of a good falls, you substitute that good for relatively more expensive goods.
Income effect:	When the relative price of a good declines, your ability to purchase goods increases, so you can purchase the same consumption bundle and have income left over to purchase other goods.

Individual Demand Curves

Using the discussion above, we can construct demand curves for individuals. We can then aggregate individual demand curves into market demand curves to examine the overall demand for a good.

Note that the law of demand basically postulates a negative relationship between price and quantity demanded, that is, as the price of a good decreases, the quantity demanded by consumers of the good increases (and vice versa).

Demand Curve:	A demand curve graphically depicts the maximum quantities of a good that individuals are willing and able to purchase at various prices during a given period, all else remaining equal.

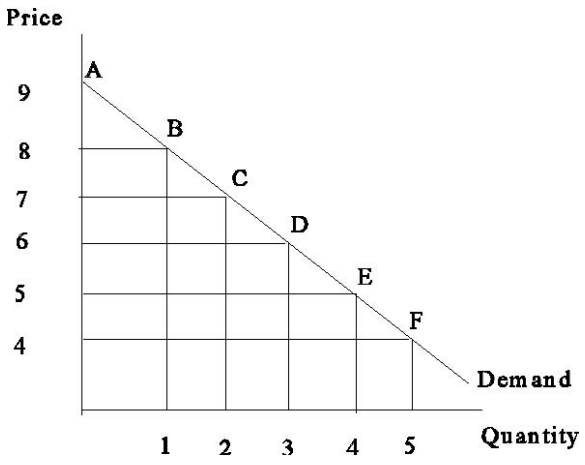
A demand curve is merely the graphical representation of a demand schedule, where a demand schedule is a tabular representation of an individual's demand for a good.

Table 1 represents an individual's demand for a gallon of gasoline.

Table 1 Individual Demand Schedule for Gallon of Gasoline

4

	Price (P)	Quantity Demanded (Qd)
A	$9	0
B	$8	1
C	$7	2
D	$6	3
E	$5	4
F	$4	5



Note that the demand curve is downward sloping, reflecting the negative relationship between price and quantity demand as stated in the Law of Demand and the Principle of Diminishing Marginal Utility.

Change numbers and re-draw for second example as necessary.

Market Demand Curves

While observing individual demand curves is a useful task, it does not lend much insight into the market demand for a specific product, where the market demand is the aggregation of all the consumers who may purchase the good in question.

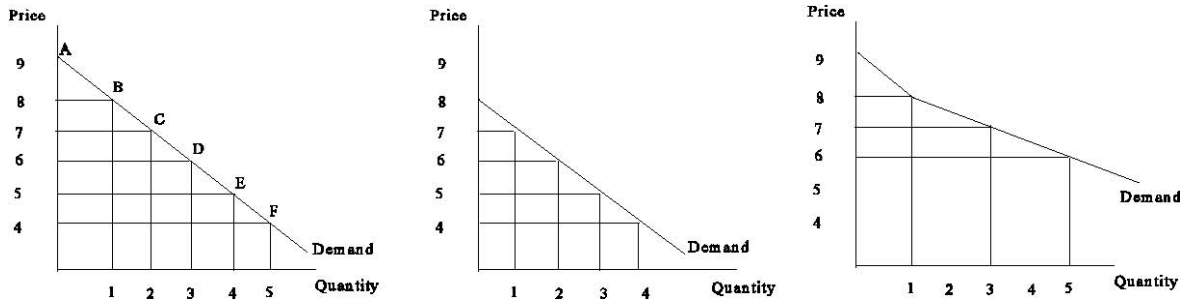
How do we construct a market demand curve? Market demand curves represent the summation of individual demand curves, that is, we add individual demand at like prices, or we horizontally sum individual demand curves. This leads to the definition of a market demand curve:

Market Demand Curve: A market demand curve is the horizontal summation of the individual demand curves of all potential buyers of a good.

Let's return to the previous example and add another individual to construct a simple representation of a market demand curve. In Table 2, we illustrate each individual's demand and sum these demands horizontally (that is, add together the quantity demanded at each price to calculate the market quantity demanded at each price).

Table 2 Market Demand Schedule for Gallon of Gasoline

	Price (P)	Individual 1 Quantity Demanded	Individual 2 Quantity Demanded	Market: Quantity Demanded
A	$9	0	0	0
B	$8	1	0	1
C	$7	2	1	3
D	$6	3	2	5
E	$5	4	3	7
F	$4	5	4	9



Now, using the discussion and examples in this chapter, construct the individual and market demand curves with the following information:

Table 3 Yearly Individual Demand Schedule for Airline Tickets: Atlanta - New York

Price Per Ticket	John	Mary	Brad	Alice
$2500	0	0	0	0
$2000	1	0	0	0
$1500	2	0	0	1
$1000	3	1	0	2
$500	4	2	1	3
$250	5	3	2	4

Side note: Quantity Demanded vs. Demand

We must be careful to note that there is a difference between the concepts of *quantity demanded* and *demand*.

Quantity demanded is just that, the absolute amount of a certain good that people are willing to purchase at a specific price. Quantity demanded is affected by prices, that is, if prices increase for a specific good, the quantity demanded by consumers will decline.

Demand, on the other hand, does not refer to a specific quantity but a collection of quantities that consumers will purchase at a collection of prices.

For example, in Table 3, we can determine that John will want to consume 4 airline tickets when the price is $500. Thus, 4 airlines tickets are the quantity demanded by John at $400. John's demand is representative by the entire column of quantities

matched with the entire column of prices.

In general, quantity demanded is determined by prices and demand is determined by a series of other factors that we will now discuss.

Other Influences on Demand

Recall that we previously discussed that are two types of prices demand prices and relative prices where market prices are those prices charged for goods regardless of whether the goods are purchased by individuals and demand prices, on the other hand, reflect the relative values and individual places on having a marginal amount more (or less) of a good.

Each good's relative price, that is, the subjective valuation placed on the good by the consumer, is influenced by a variety of factors. In this section, we will examine what those factors are and how they influence a good's relative price.

The influences we will discuss are:

1. Tastes and Preferences
2. Income and Income Distribution
3. Prices of Related Goods
4. Numbers and Distribution of Population
5. Expectations on Prices, Incomes, and Good Availability
6. Taxes, Subsidies, and Regulations

Tastes and Preferences

Tastes and preferences are the underlying motivators for the consumption of many goods, that is, do we prefer to consume fine steak or tofu? Big SUV's or economical mini-cars? As tastes and preferences change, relative prices change accordingly. That is why 'last year's fashion' is cheaper than this year's latest item because we place a lower value on a product that is not in tune with what we perceive as 'in fashion.'

Income and Income Distribution

We can generally categorize economic goods into two types: normal and inferior goods.

Normal goods are those goods whose consumption increases as income increases, that is, there is a positive relationship between income and demand for these goods.

Inferior goods, on the other hand, are those goods whose consumption declines as income increases, that is, there is a negative relationship between income and demand for these goods.

Why are goods normal or inferior? Inferior goods are those goods we consume because we lack sufficient income to consume more preferable goods (top ramen instead of vermicelli), so as our income increases, we substitute away from these goods to one's we have desired to consume but have lacked the ability to purchase.

Prices of Related Goods

We can observe that the prices of related goods are interdependent. If two goods are used together (cars and tires), a rise in the price of cars leads to a decline in demand for tires. Conversely, if two goods can be used in place of one another, then if the price of one good rises, we will observe that the demand for the other good increases.

There are two types of related goods: substitutes and complementary goods.

Substitutes:	Substitutes are the goods increasingly purchased in the place of the item in question when its price rises, or vice versa.
Complementary goods:	Complementary good generate more utility (satisfaction) if consumer together. Increases in the price of a good tend to reduce demands for its complements, and vice versa.

Simply put, goods that are substitutes for each other are negatively correlated while complementary goods are positively correlated.

Numbers and Distribution of Population

The population characteristics of a society can influence the demand for goods and services. If, for example, the population is relatively young, demand for athletic goods and alcohol are likely to increase relatively to when the population is relative older.

Expectations on Prices, Incomes, and Good Availability

We can turn to the stock market to examine how expectations on prices, incomes, and goods availability can influence the demand for certain products. Let us, take for example, the rapid increase in demand for Internet stocks in December 1998.

Why did these stocks increase rapidly in value? Individual investors formed expectations that the prices of these stocks would increase and in a sense these

expectations when taken on the market level were self-fulfilling. As more investors expected the stocks to rise, the demand for these stocks increased.

The same impact can be had with expectations on income. If we expected that income taxes would decline by 50% next year, our consumption patterns would likely be dramatically affected. We would like increase our demands for normal goods and luxuries and decrease our demands for inferior goods.

Now, how would our expectations on the availability of a certain good affect our demand for the good (hint: think Furby, Cabbage Patch, Power Ranger).

Taxes, Subsidies, and Regulations

Of course, no discussion what might affect demand is incomplete without examining the impact of the public section. First, let us make a observation and then we will discuss the normative aspects of public policy as it affects demand. We will touch on this topic later on in the class.

Let us assume that the figure above represents the demand for cigarettes by individuals. At $3 a pack, national demand might by 3 billion packs of cigarettes a year. Now, if the government imposed a $1 a pack tax on cigarettes what impact would this have on demand?

ILLUSTRATE

Recall, that demand prices are based on our subjective valuation of the goods in question. So, the tax does not impact demand prices, that is, at $3 with or without the tax, consumers will demand 3 billion packs of cigarettes. This is represented by demand curve D0.

However, for suppliers of cigarettes, their view of demand is quite different. The price they receive after the tax is collection is lower by one dollar a pack. They view this as a shift of demand from demand curve D0 to D1 since the after tax price for 3 billion cigarettes is $2 a pack.

What happens? From the consumer's perspective, taxes would not affect their demand, but for suppliers, they would act as if demand had shifted downward.

Now, instead of a tax, consider a subsidy. Apply the same logic to find that demand from the consumer's perspective is not altered but that suppliers view a subsidy as resulting in an increase in demand from D0 to D2.

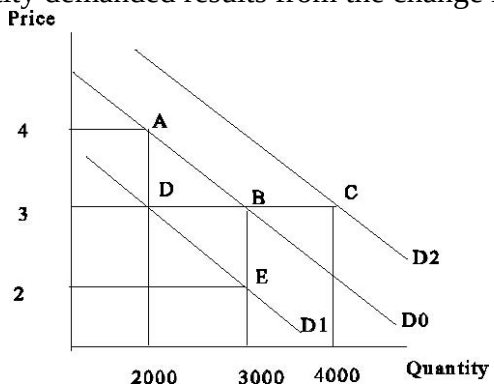
Changes in Quantity Demanded vs. Changes in Demand

In the previous section we discussed the various influences on demand. We have also noted the difference between changes in quantity demanded and changes in

demand. In this section, we summarize these results.

A change in demand results if a determinant of demand, other than a good's own price, changes. A positive or increase in demand results in an outward shift of the demand curve. A negative or decrease in demand results in an inward shift of the demand curve, respective to the origin.

A change in quantity demanded results from the change in the price of the good.



Change in Quantity Demanded: Assume that we start on demand curve D0 and that he price is $3. Quantity demanded is 3,000. If price changes to $4, quantity demanded declines to 2,000.

Change in Demand: Assume that we are examining the demand for turkeys and that our initial demand curve is D2, with a price of $3/lb and quantity demanded of 4,000 lbs. Now, assume that the price of chicken declines 50%. Consumers substitute away from turkey to chicken and demand shifts from D2 to D1. Demand decreases. As a result, the amount of turkey demanded for consumption declines from 4,000 to 2,000.

7. Supply

Every market consists of two elements, demand and supply. In the previous section, we examined the negative relationship between price and quantity demanded, what are the determinants of demand, and how these determinants affect demand. We now turn to the other side of the market to investigate how price and quantity supplied are related, what are the determinants of supply, and how these determinants affect supply.

In economics, when we refer to supply we are referring to the quantity of a specific good that sellers will provide under alternative conditions during a given period.

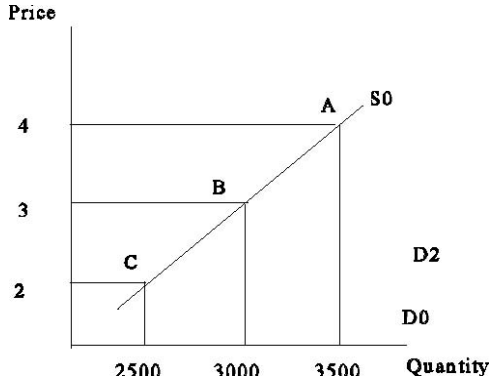
We will, as with demand, differentiate between quantity supplied and supply. Quantity supplied is the amount of a specific group provided by sellers at one specific price, that is, one gallon of milk for $2. Supply, on the other hand, refers to the amount of the specific good that will be provided by sellers across a range of prices, that is, how much milk at $1, how much milk at $2, and so on.

As with demand, quantity supplied is primarily affected by changes in price while supply is affected by the determinants of supply.

Law of Supply: All else being equal, higher prices induce greater production and offers to sell more output during a given period, and vice versa

Thus, there is a positive relationship between quantity supplied and price.

We can graphically illustrate the relationship between quantity supplied and price by construction a supply curve, where a supply curve illustrates the maximum amount of a specific good that firms are willing to provide at a various prices during a given period.



The figure above is merely a graphical representation of the following supply schedule. Assume we are examining the production of cigarettes.

Table 4 Supply of Cigarettes by Phillip-Morris

Price Per Pack	Quantity Supplied (thousands)
4	3500
3	3000
2	2500

Now, this is an individual supply curve. We can obtain the market supply curve by

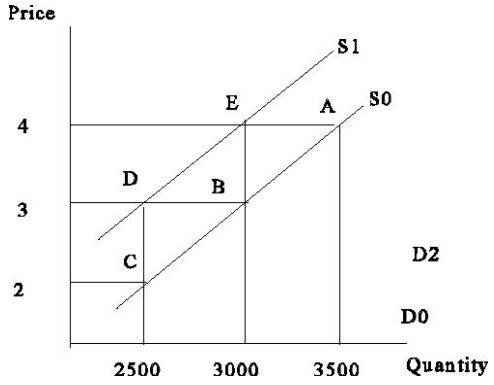
horizontally summing the supply curves of the producers in the market. Table 5 contains the individual supply schedules for 3 cigarette makers. Using the data contained in Table 5, construct the individual supply curves and the market supply curve.

Hint: To construct the market supply curve, we add up the quantity supplied at each price as we did in constructing the market demand curve.

Table 4 Supply of Cigarettes

Price per Pack	Phillip-Morris	American Tobacco	Liggett
$7	5000	6000	1200
$6	4500	5000	1000
$5	4000	4000	800
$4	3500	3000	600
$3	3000	2000	400
$2	2500	1000	200
$1	2000	0	0

Changes in Supply



We previously discussed what is the difference between a change in supply and a change in quantity supplied. We observed that quantity supplied changes in reaction to changes in price and that other factors influence supply. In this section, we will discuss those factors and how they influence supply.

Note the figure above. Assume that our initial supply curve is S1. If price rises from $3 to $4, the quantity supplied will increase from 2500 to 3000. Now, if the supply curve shifts from S1 to S0, then supply has increased; conversely if supply shifts from S0 to S1, supply has decreased.

We now turn to what factors may influence supply to increase and decrease.

Production Technology

As technological processes change, suppliers ability to produce products on a whole change as a result. For example, the invention of the transistor led to the invention of the microprocessor and dramatically lowered the cost of producing computers, thus shifting the supply curve outward as suppliers were able to supply more (and better) computers at lower cost.

A natural disaster (Hurricane Mitch in Guatemala) might have such a devastating impact that a country regresses in terms of technology, that is, its capability to use more advanced technology is wiped out. In such cases, the supply curve shifts inward representing a decrease in supply.

Resource Costs

As land, labor, capital, and entrepreneurship are inputs into the production process, an increase in the price of these inputs represents an increase in production costs, thus shifting the supply curve inward. Conversely, a decrease in the price of resource inputs results in a decrease of production costs, leading to a increase in supply (supply curve shifts outward).

Prices of Related Producible Goods

In terms of supply, we must examine the prices of related producible goods, that is, goods that share the same production process and inputs as other goods. Thus, if the price of a related producible good decreases (for example, the price of buttermilk decreases), then producers will shift resources to the production of other, higher priced goods (for example, regular milk or cream).

This would lead to an increase in the supply of the higher priced good (milk) and a decrease in the supply of the good whose price has fallen (buttermilk).

Producers' Expectations

Much like consumers' expectations influencing demand, producers' expectations can have a significant impact on supply. Producers may believe that prices will decline in

the future, thus they attempt to sell off current inventories and scale back on production. In the short-run, the supply curve may shift outward, however, in the long-run, the supply curve will shift inward (supply decreases) as productive capacity declines.

Number of Sellers

Simply put, as more producers enter a given market, the amount of goods available for sale increases. The number of sellers and supply are positively correlated.

Taxes, Subsidies, and Regulations

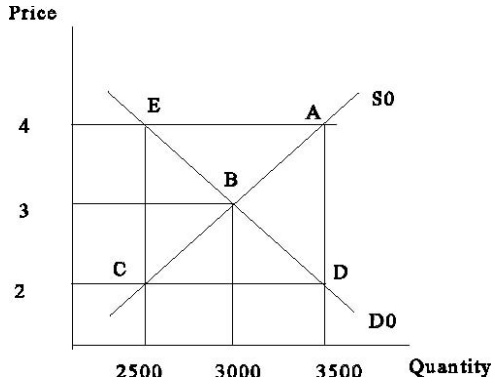
As previously discussed with respect to demand, taxes and subsidies create a wedge between consumer and supplier prices. For example, consider a $1 a pack tax on cigarettes. Let us assume that the initial price is $3 and 4,000 million packs are sold. Now, the government levies a $1 per pack tax on cigarettes. For suppliers, the after-tax price is still $3 and supply does not respond, but consumers would perceive a decrease in supply since now the same quantity (4,000) requires $4 a pack.

Subsidies work in similar fashion. Now, consider a $1 a pack subsidy on cigarettes. For suppliers, again, there is no change in their supply curve since the post-subsidy price is still $3 a pack (the subsidy is for consumers). However, consumers would perceive an increase in demand since it would appear that price has decreased by $1 pack, so $2 a pack for the market price would result in a supply of 4,000 million packs.

In-class exercise: Graph the above example.

Market Equilibrium

We have now examine the demand side and supply side of the market. We can now bring these together to determine what is the price and quantity that will result from the interaction of demand and supply forces.



The above figure represents a market equilibrium at a price of $3 and a quantity of 3,000. At the market equilibrium, any pressure to move from the equilibrium price of $3 is offset by other forces in the market (unless it is demand or supply that shifts).

For example, let us assume that suppliers incorrectly set the price of the good at $4. At $4, consumers will only demand 2,500 while suppliers will bring 3,500 units to market. This results in a surplus of 1,000 units. Conversely, if suppliers incorrectly set the price of the good at $2, consumers will demand 3,500 and suppliers will only supply 2,500, leading to a shortage of the good in question.

Simply put, a surplus is an excess of quantity supplied over quantity demanded when the price is above equilibrium price. A shortage is an excess of quantity demanded over quantity supplied when the price is below the equilibrium price.

What happens when a surplus (shortage) exists in the market. If there is an excess (shortfall) of a product, producers will find their inventories increasing (decreasing) and will curtail (increase) production in response to the increasing (decreasing) inventories. As production falls (increases), the amount available in the market for sale will decrease (increase) and movement will occur towards the equilibrium price and quantity.